

REMARKS

With the entry of this Response, Claims 1-13 are currently pending. Claims 2 and 12 have been previously withdrawn and Claims 1, 3-11, and 13 are under consideration. In this Response, Applicants have amended Claims 1, 2, 3, 4, 5, 7, 8, and 13. Support for the amendments to Claims 1 and 2 can be found in the as-filed claims and in the specification at least at paragraphs [0025]-[0028], [0039]-[0040], [0044], and [0051]. Support for the amendments to Claim 3 can be found in the specification at least at paragraphs [0026]-[0027] and [0052]. Support for the amendments to Claim 4 can be found in the specification at least at paragraphs [0051]-[0052]. Support for the amendments to Claim 5 can be found in the specification at least at paragraphs [0025]-[0028]. Support for the amendments to Claims 7 and 8 can be found in the specification at least at paragraphs [0028]-[0029]. Support for the amendments to Claim 13 can be found in the specification at least at paragraphs [0047]-[0048]. Claim 1 is the only independent claim. In view of the subsequent remarks regarding the above-mentioned independent claim, Applicants respectfully request allowance of all the pending claims.

35 U.S.C. § 112, 2ND PARAGRAPH, REJECTION

The Office Action rejected Claim 1 under 35 U.S.C. § 112, 2nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. (Office Action, p. 3). In this Response, Applicants have amended Claim 1. Applicants respectfully submit that the amendments to Claim 1 render this rejection moot, and in light of these amendments, Applicants respectfully request that the Examiner withdraw this rejection.

35 U.S.C. § 103(A) REJECTION

A. Claims 1, 3-8, 10, and 11

The Office Action rejected Claims 1, 3-8, 10, and 11 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,617,215 issued to Sugahara *et al.* (hereinafter "Sugahara"). The Office Action stated:

Sugahara teaches an acid treatment process of natural alumina-silica type comprising mixing the clay with an acid followed by extraction and removal of basic metal constituents that are recovered. The clay is admixed with an aqueous acid solution

to produce a slurry . . . Sugahara explains that this method is beneficial because it leads to effective utilization of acid and the extracted product.

(Office Action, pp. 4-5). The Office Action further stated:

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose a method of preparing a mineral composition by acid extraction of clay soil, as taught by Sugahara. One of ordinary skill in the art at the time the invention was made would have been motivated to use such a method because it leads to effective utilization of acid and the extracted product, as explained by Sugahara.

(Office Action, p. 6). Applicants respectfully traverse this rejection to the extent that it applies to the amended claims.

Under 35 U.S.C. § 103(a), the Patent Office bears the burden of establishing a *prima facie* case of obviousness. A *prima facie* case of obviousness requires: (1) that there be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the teachings of reference or to combine the teachings of multiple references; (2) that there be a reasonable expectation of success; and (3) that the prior art reference, or references when combined, teach or suggest all of the elements of the claim. (See, e.g., M.P.E.P. § 2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and cannot be based on Applicants' disclosure. (See, e.g., *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In re Fine*, 87 F.2d 1071, 1074 (Fed. Cir. 1988)). Furthermore, rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be explicit analysis including some rational underpinning to support the legal conclusion of obviousness. (*K.S.R. Int'l Co. v. Teleflex, Inc.*, 550 U.S. 14 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). If the references do not teach each and every claimed element, then a finding of obviousness fails.

Applicants respectfully submit that the present Office Action does not meet its *prima facie* burden. Sugahara fails to teach or suggest Applicants' currently claimed method. Rather, Sugahara is directed to a method that requires two acid treatment steps to yield an "activate clay" or "finely divided silica" by removing "acid-soluble basic constituents". Sugahara discloses a process of acid treatment for alumina-silica type clay, which comprises a first dry acid treatment

step in which the alumina-silica type clay is mixed with an acid to form a plastic or solid reaction product, and a second extraction step using an acid with a pH not more than 1.0 in which the basic metal constituents contained in the reaction products are removed. See, for example, Col. 2, lines 6-13 and Col. 2, lines 22-36. For example, at Col. 1, lines 7-13, Sugahara states “the invention relates to a new acid treatment process of alumina-silica type clay which comprises in combination a dry acid treatment step wherein said alumina-silica type clay is admixed with an acid to form directly a nonfluid solid reaction product, and extraction step wherein the basic metal constituents contained in said reaction product are extracted and removed.” Acid is added at both of the two acid treatment method of Sugahara and this is the only method disclosed in Sugahara.

Sugahara teaches that one of the products resulting from this two acid treatment method is one made from the “basic constituents” or “basic metal constituents” which are Al_2O_3 , FeO , Fe_2O_3 , CaO and MgO , which forms a “solid iron-containing aluminum sulfate” made from the salts of the reacted basic constituents. See Col. 9, lines 20-23, and Col. 3, lines 46-48. The amount of basic metal constituents to be removed depends on which one of the other two products resulting from the two acid treatment method is desired. When active clay is the intended product, about 10 to 90 percent of basic metal constituents are removed. When finely divided silica is desired, “as much as possible of the total basic metal constituents [in the starting material] is removed.” See Col. 3, line 75 through Col. 4, line 6.

An important feature of the method of Sugahara is that a “nonfluid solid reaction product” is formed in the first step, the reaction step, by “intimately admixing the acid or an aqueous solution thereof” with the starting clay material. See Col. 4, lines 38-42. “The important thing is to ensure that the reaction conditions are so established that a nonfluid solid reaction product is obtained on termination of the reaction.” Col. 5, lines 18-20. When the clay/acid mixture has a higher water content, the mixture is heated to remove the free water. “The maintenance of the mixture in a dry state is readily accomplished by heating the mixture positively. Thus the reaction between the acid and the basic metal constituents proceeds while the free water is being eliminated from the mixture.” See Col. 5, lines 57-61. When there is too much water, a unstable slurry is formed, and the reaction cannot proceed. See Col. 6, lines 1-19.

When the acid or aqueous acid solution is used in an amount outside the hereinbefore noted range as prescribed by the invention, i.e., when the acid or aqueous acid solution is used

in a proportion in excess of 2.5 parts by weight of the acid or aqueous acid solution to one part by weight of dry clay, the mixture of the material clay and the acid or aqueous acid solution forms an unstable slurry from which there is the tendency to the separation readily of a supernatant liquid, with the consequence that it is utterly impossible to hope for an intimate contact of the material clay and the acid or aqueous acid solution as a unitary mass. In contradistinction, when, as in this invention, the acid or aqueous acid solution is used in proportion of 1.5 to 2.5 parts by weight thereof to one part by weight of the dry clay, the material clay and the acid or aqueous acid solution forms a stable, creamy, intimate mixture in which the acid and the basic metal constituents react even when said mixture is merely allowed to stand in an open or closed atmosphere to yield directly a plastic or solid reaction product.

The first acid treatment step of Sugahara yields a plastic or solid reaction product which is then "granulated into an optional form". See Col. 6, lines 29-30. If the first acid treatment step yields a reaction product that is "creamlike, it can be fed or sprayed either into a heated gas atmosphere or onto a heated plate in streamlets or small drops, thus removing the water content of the mixture and at the same time reacting the acid with the basic constituents contained in the mixture to form concurrently the reaction product into granules or small aggregates." Col. 6, lines 35-42. "Alternatively, the mass of plastic or solid reaction product formed in a suitable vessel or a conveying means can be roughly ground into small aggregates of suitable size." The Sugahara method requires the formation of a solid particle made from the interaction of acid and clay. This is not a teaching of Applicants' currently claimed invention.

After the first acid treatment step, wherein clay and acid are admixed, and a solid particle is formed, then a second acid treatment step is performed on the solid particle, "the basic metal constituents contained in the solid reaction product are extracted and removed therefrom with an aqueous medium of a pH not more than 1, and preferably not more than 0.5." See Col. 6, lines 51-54. The method of Sugahara requires this second acid treatment step to be performed with an acid solution having a pH of less than 1, because if the pH is greater than 1, then "there is a tendency of the salts of the basic metal constituents to become susceptible to hydrolysis to result in a decline in the quality of the product, Hence, the aqueous medium used in the invention process is one having a pH of not more than 1, and preferably not more than 0.5." See Col. 6, lines 55-60. The method of Sugahara requires that the solid particles are extracted with a second

acid solution having a pH of not more than 1. This is not a teaching of Applicants' currently claimed invention.

In summary, the method taught by Sugahara for making active clay or finely divided silica requires two acid treatment steps. The first acid treatment step admixes an acid and a clay to form a mixture that is granulated into solid, dry particles (the "reaction product"). If necessary, the acid/clay mixture is dried to remove an water present. These solid particles are then extracted in the presence of an acid with a pH of 1 or less (the "extraction medium"), and the salts of basic metal constituents are removed by this acid extraction step. This is a two step method requiring the addition of an acid to clay to form solid particles, and the extraction of the basic metal constituents from the solid particles. "Thus, in this embodiment of the present invention, as it is possible to maintain the acid treated clay in a form of granules or small aggregates throughout the extraction operation, such advantages as easy separation of the product from the extraction medium and easy after treatment are brought about." See Col. 7, lines 24-28. This is not a teaching of Applicants' currently claimed invention.

The examples of Sugahara teach the two acid treatment steps and particle formation method. In Example 1, Sugahara teaches a method in which clay is mixed with sulfuric acid in a first step to form a reaction product that is granulated. In the second step, the granulated solid reaction product is placed in a glass tube and exposed to a sulfuric acid solution having a pH of 0.5 to elute the soluble salts of the basic metal constituents of the reaction product. "The soluble salts formed by this operation was eluted. Since the specific gravity of the solution of the salts was greater than that of the sulfuric acid solution, the former settled to the bottom of the column." When cooled, the extracted liquid hardened into a solid iron-containing aluminum sulfate. "The cylindrical granular products maintained their granular form without becoming slurrylike until the completion of the water-washing operation." The method requires formation of a solid granular product by the interaction of an acid and the clay in a first acid treatment, and the particles maintain their physical form as a solid granule throughout the second acid treatment.

In Example 2, Sugahara teaches a method in which clay is mixed with sulfuric acid in the first step to form a small flaky granular reaction product. In the second step, the reaction product was introduced into sulfuric acid solution having a pH of 0.5, and the soluble salts formed by the reaction were extracted and separated, generating an iron-containing aluminum sulfate and an

acid-treatment completed acid clay. Col. 10, line 6 through Col. 11, line 15. In Example 3, a finely divided silica is formed. The clay was thoroughly mixed with sulfuric acid using a kneading molder and the mixture was granulated. The resulting granules were subjected to an acid having a pH of 0.5 to extract and recover the soluble basic constituents. It is unclear from Example 3 whether there were two or three acid treatment steps in this method. Ultimately, a finely divided silica product as well as a solid-iron containing aluminum sulfate product were obtained. Col. 11, line 17 through Col. 12, line 24. In Sugahara, Examples 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 use the two- (or three) step acid treatment steps disclosed in Examples 1, 2, and 3.

Applicants respectfully submit that the skilled person would recognize that Sugahara fails to teach or suggest a method for preparing an extracted mineral element composition as currently claimed. Sugahara teaches away from Applicants' currently claimed process by teaching a first acid treatment step that results in a clay/acid mixture that results in, or is formed into, a solid particle. Using an acid with a pH of not more than 1 and a nonfluid solid reaction product, Sugahara teaches that "there is no need at all of handling the clay in its difficulty handled state, and that the reaction of the basic metal constituents contained in the material clay and the acid of aqueous acid solution in carried out in the solid phase through the course of the reaction." Col. 5, lines 29-34. Sugahara teaches at least a second step of acid treatment of the solid particle, which requires use of an acid solution having a pH of 1 or less, to elute the salts of the basic constituents. The method of Sugahara requires at least two acid treatments and the formation of a solid granular product. The method of Sugahara does not provide a teaching or suggestion of Applicants' currently claimed invention.

For at least these reasons, Sugahara fails to teach or suggest every element of Applicants' currently pending claims. Therefore, Sugahara fails to render obvious independent Claim 1. Applicants note that Claims 3-8, 10, and 11 are dependent upon independent Claim 1. Therefore, as "dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious" (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)), Applicants submit that Sugahara also fails to render as obvious dependent Claims 3-8, 10, and 11. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow these claims.

B. Claims 1, 3-11, and 13

The Office Action rejected Claims 1, 3-11, and 13 under 35 U.S.C. § 103(a) as obvious over Sugahara in view of published U.S. Patent Application No. 2004/0258597 to Michalakos *et al.* (herein “Michalakos”). (Office Action, p. 7). Applicants respectfully traverse this rejection to the extent that it applies to the amended claims.

It is the burden of the Office to provide a rationale from the prior art for making the specific claimed modification or combination. The Supreme Court recently addressed nonobviousness of “combination” inventions in *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007) (*KSR*). The Court confirmed that it is legally insufficient to merely point to the various recited elements. Instead, the Office must identify the basis for the alleged modification or combination by one of ordinary skill to arrive at the claimed invention.

The Office Action applied Sugahara in this § 103(a) rejection in the same way and for the same disclosure for which the Office Action applied Sugahara in the § 103 rejection discussed above. Applicants respectfully submit that the skilled person would recognize that Sugahara fails to teach or suggest a method for preparing an extracted mineral element composition as currently claimed. Sugahara teaches away from Applicants’ currently claimed process by teaching a first acid treatment step that results in a clay/acid mixture that results in, or is formed into, a solid particle. Using an acid with a pH of not more than 1 and a nonfluid solid reaction product, Sugahara teaches that “there is no need at all of handling the clay in its difficulty handled state, and that the reaction of the basic metal constituents contained in the material clay and the acid of aqueous acid solution in carried out in the solid phase through the course of the reaction.” Col. 5, lines 29-34. Sugahara teaches at least a second step of acid treatment of the solid particle, which requires use of an acid solution having a pH of 1 or less, to elute the salts of the basic constituents. The method of Sugahara requires at least two acid treatments and the formation of a solid granular product. The method of Sugahara does not provide a teaching or suggestion of Applicants’ currently claimed invention.

The Office Action cited Michalakos for teaching that water purification by reverse osmosis was known in the art at the time that Applicants filed the present application. The teaching of Michalakos does not supplement what Sugahara fails to teach or suggest. Thus, the combination of Sugahara and Michalakos does not result in a method for preparing an extracted mineral element composition as currently claimed by Applicants. This combination also fails to

provide to the skilled person with the necessary guidance or motivation to arrive at Applicants' currently pending claims. Therefore, the Office Action fails to meet its *prima facie* burden and Applicants respectfully submit that this combination fails to render as obvious independent Claim 1.

Applicants also note that Claims 3-11 and 13 are dependent upon independent Claim 1. Therefore, as "dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious" (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)), Applicants assert that Sugahara also fails to render as obvious dependent Claims 3-11 and 13. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow these claims.

CONCLUSION

The foregoing is a complete response to the Office Action dated September 29, 2009. Applicants respectfully submit that at least Claims 1, 3-10, 11, and 13 are patentable. Early and favorable consideration is solicited.

Applicants file this response solely to facilitate prosecution. As such, Applicants reserve the right to pursue claims of broader or similar scope as originally filed in a continuation application or other application after allowance of the present application. Applicants do not concede that the current or past rejections are correct and reserve the right to challenge such rejections later in prosecution or on appeal. Accordingly, any amendment, argument, or claim cancellation is not to be construed as abandonment or disclaimer of subject matter. Because certain of the current amendments may include broadening amendments, Applicants respectfully request that the Examiner revisit any previously reviewed references cited in this Application to further ensure that the currently pending claims remain patentable over any previously reviewed references. If the Examiner believes there are other issues that can be resolved by a telephone interview, or that there are any informalities that remain in the application that may be corrected by the Examiner's amendment, then a telephone call to the undersigned attorney at (678) 420-9428 is respectfully solicited.

With this Amendment and Response, Applicants also enclose a Petition for an Extension of Time pursuant to 37 C.F.R. § 1.136(a), a credit card payment in the amount of \$1,110.00 for the large entity fee for a three-month extension of time pursuant to 37 C.F.R. § 1.17(a)(3), and an Applicant Initiated Interview Request Form (Form PTOL-413A). Applicants believe that this is the correct amount due; however, Applicants hereby authorize the Commissioner to charge to Deposit Account No. 14-0629 any additional fees that may be required, or to credit to that same account with any overpayment of fees.

Respectfully submitted,
/MaryAnthonyMerchant Reg.No.39,771/
Mary Anthony Merchant, J.D., Ph.D.
Registration No. 39,771

BALLARD SPAHR LLP
Customer Number 23859
(678) 420-9300
(678) 420-9301 (fax)